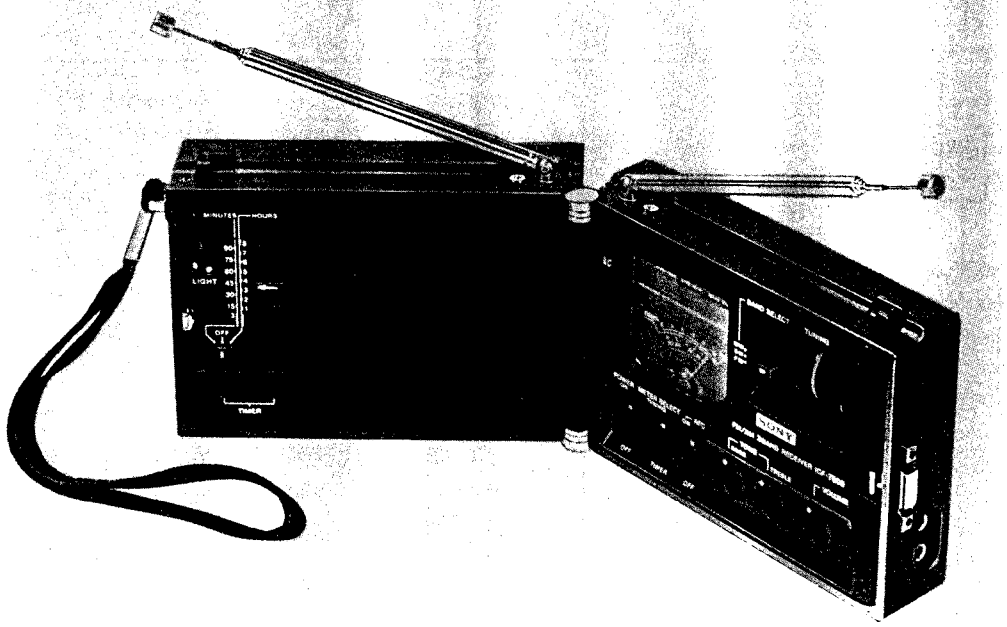
ICF-7800

AEP Model
UK Model
E Model



FM/AM 3-BAND RECEIVER

SPECIFICATIONS

Power Requirements:
6V dc, four batteries size AA (IEC Designation R6)
240V ac, 50Hz with optional AC Adaptor & Charger AC-15 (for UK model)
110V or 220V ac, 50/60Hz with optional AC Power Pack AC-456C (for AEP model)
220–240V ac (100 or 110–127V adjustable), 50/60Hz with optional AC Adaptor & Charger AC-4W (for E model)
12V car battery with Sony Car Battery Cord DCC-127H (optional)

Power Consumption:
6VA with the AC-15
8.5VA at 50Hz with the AC-456C
6.5VA at 60Hz with the AC-456C
9VA at 50Hz with the AC-4W
9VA at 60Hz with the AC-4W

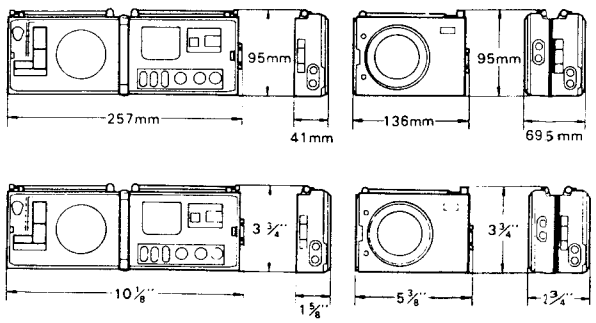
Frequency Range:
FM 87.5–108MHz
SW 3.9–12MHz (77–25m)
MW 530–1,605kHz

Aerials:
FM telescopic antenna
FM/SW telescopic antenna
MW built-in ferrite-rod antenna

Speaker:
Approx. 7.7cm (3 inches) dia.

Outputs:
Earphone (minijack) 1
Recording (minijack) 1
MPX OUT (minijack) 1

Approximate Dimensions:



including projecting parts and controls

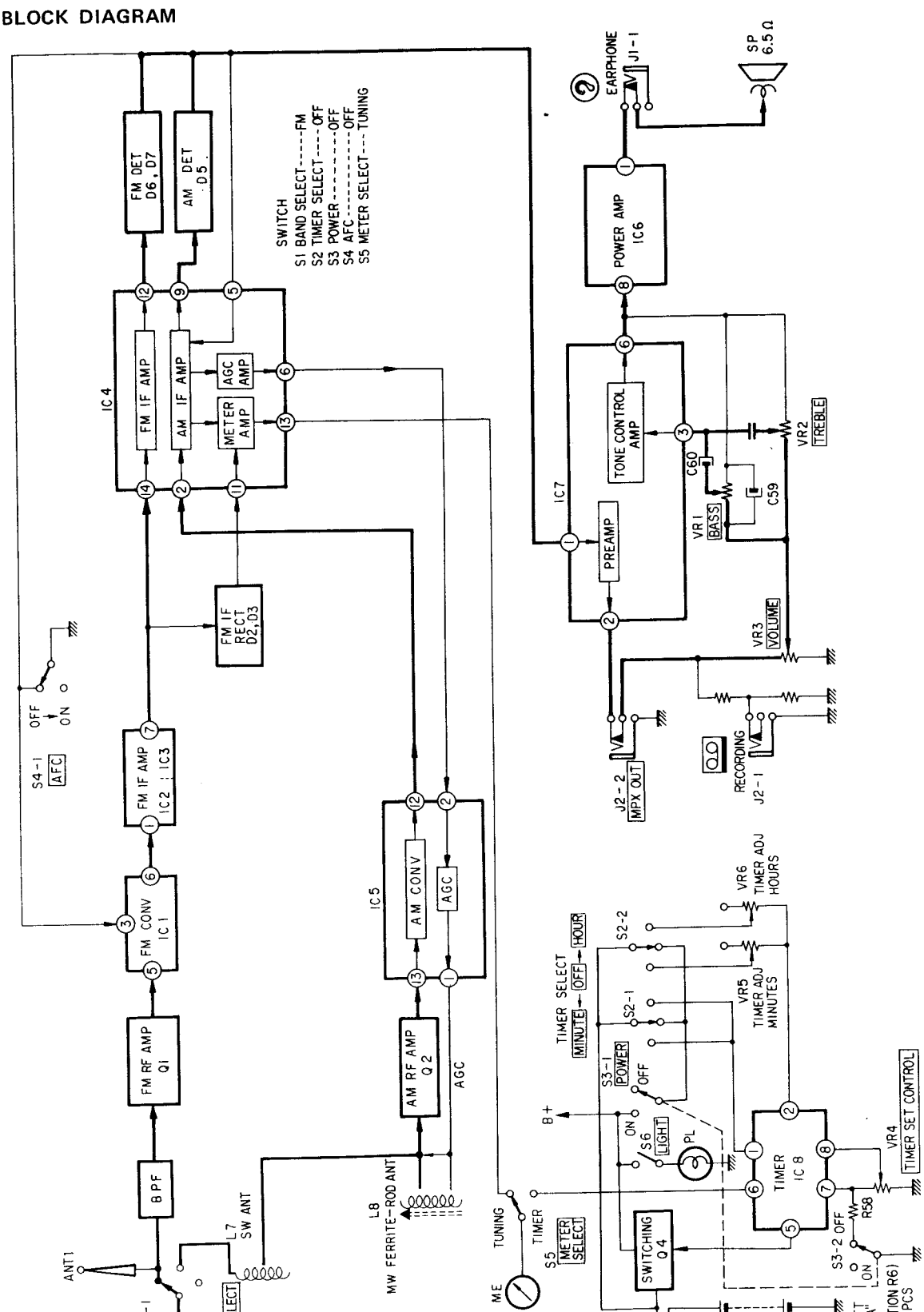
Weight:
Approx. 780g, 1lb 12oz including batteries

SONY

SERVICE MANUAL

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM



1-2. CIRCUIT DESCRIPTION

(1) Electronic Timer

This radio receiver uses an electronic timer which one IC contains the blocking oscillator, the counter, the digital-analog (DA) converter, the comparator, the switching circuit, the remaining-duration-time detector, the voltage regulator and the current detector.

This blocking oscillator produces a reference signal for the timer. The timer selector S2-1 (96 minutes/8 hours) selects time constant of the oscillator to change the oscillation frequency. The oscillation can be checked by observing the sawtooth wave on the oscilloscope connected to terminal 2 of IC8. The cycle period of sawtooth wave should be 0.35156 seconds for 96-minute timer and 1.7578 seconds for 8-hour timer. The acurate frequency, however, can not be read on the oscilloscope, since the oscilloscope connection changes time constant of the oscillator.

The sawtooth wave produced by the oscillator is demultiplied into a pulse wave at the counter and then converted into the analog signal by the DA converter. The circuit of this converter is as shown in Fig. 1-2. The pulses supplied at Ⓐ charges capacitor C step by step and gradually increases the voltage at Ⓑ.

In the next stage, the comparator, the voltage at Ⓑ is compared with the voltage determined by VR4 (TIMER SET CONTROL).

When those two voltages becomes equal, the comparator actuates the switching circuit. Then the switching circuit turns Q4 ON or OFF to switch B+ circuit ON or OFF.

On the other hand, the difference of those two voltages is detected by the remaining-duration-time detector and is indicated as remaining-duration-time on the meter. The voltage regulator supplies stable reference-voltage to the comparator through VR4. The current detector detects output current change of the voltage regulator caused by turning S3-2 ON or OFF and actuates the switching circuit.

That is, if the POWER switch S3-1 is turned ON and the timer is preset, the radio section will be automatically switched ON at the preset time, and if the POWER switch S3-1 is turned OFF and the timer is preset, the radio section will be switched OFF at the preset time.

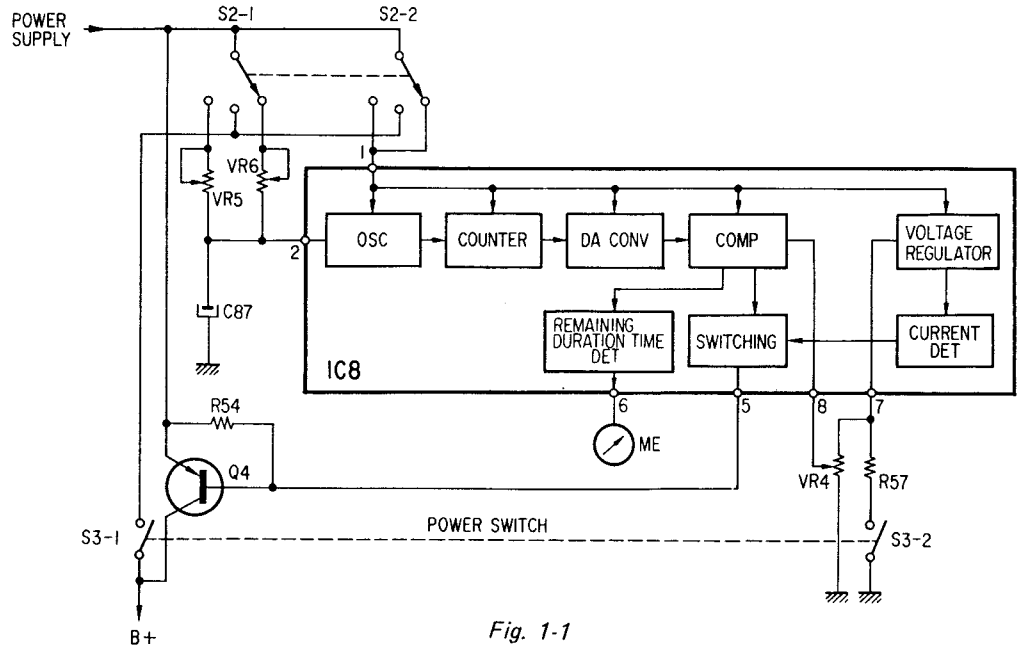


Fig. 1-1

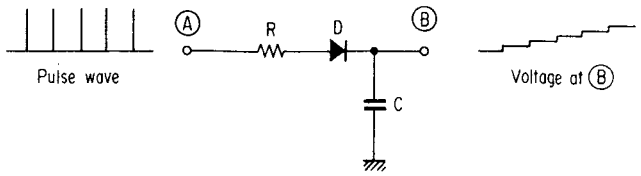


Fig. 1-2

(2) Tone Control

An NF (Negative Feedback) type where the VOLUME controls the amount of feedback. Bass and treble emphasis are more pronounced when the VOLUME is at a lower setting.

VR1 (BASS)

Due to the effect of C59, the impedance across Ⓒ and Ⓓ in Fig. 1-3 is low at high frequencies and high at low frequencies. Therefore, the low frequencies feedback signals are emphasized at Ⓒ but de-emphasized at Ⓓ. Consequently, if the VR1 slider is shifted in the direction of Ⓒ, the amount of low frequency feedback will increase, thus reducing the amount of bass in the sound. If, however, the slider is shifted in the direction of Ⓓ, the amount of feedback is reduced and the VR3 output level is increased. So the low frequencies in the IC7 output are emphasized.

VR2 (TREBLE)

High frequencies are better able to pass through C61 than low frequencies. So the VR2 (TREBLE) action controls the high frequencies in the IC7 input signals. When the VR2 slider in Fig. 1-3 is shifted in the direction of Ⓔ, the amount of high frequency negative feedback is increased while the signal level of the VR3 (VOLUME) output is reduced. So the IC7 output will be low in high frequency signals. But when the slider is shifted in the direction of Ⓓ, the amount of negative feedback of high frequency signals is reduced, and the VR3 output signal is increased, resulting in an emphasis of the high frequencies in the IC7 output.

VR3 (VOLUME)

The IC7 input signal level is increased when the VR3 slider is shifted in the direction of Ⓖ. The impedance across the TONE control (VR1 and VR2) to ground portion is consequently increased, reducing the relative proportion of impedance due to C59 and C61, and thus the relative effect of the TONE control. But when the VR3 slider is shifted in the direction of Ⓗ, the effect of the TONE control is increased, producing a kind of loudness effect.

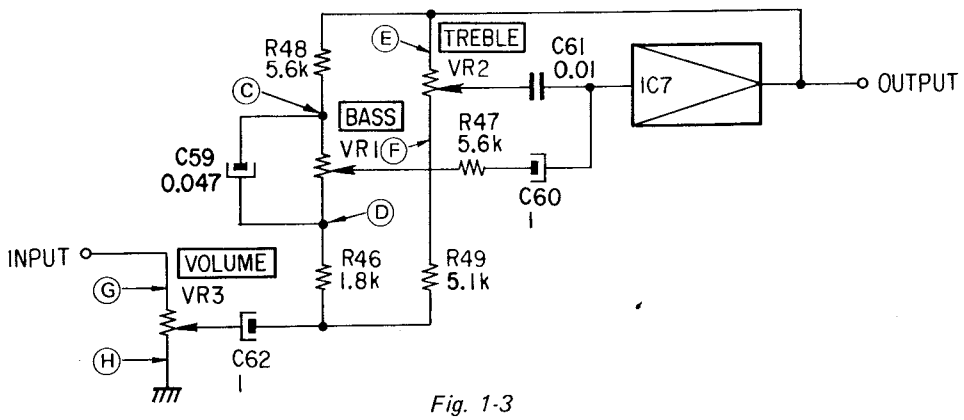


Fig. 1-3

(3) Oscillator

Since a large part of the circuitry has been replaced with ICs, it is no longer possible to check the operation of the local oscillator directly with a VOM. The oscillation can be checked, however, by the following procedures.

FM Local Oscillator Check

Receive the local oscillation signal with another FM receiver. The frequency should be received at a position 10.7 MHz higher than the dial position.

SW Local Oscillator Check

Receive the local oscillation signal with another SW receiver. In this case, the reception is a little more difficult, so it is suggested that the SW receiver be placed quite close to the test receiver, and that both telescopic antennas be fully extended. If the oscillator is functioning properly, the frequency will be received 468 kHz higher than the dial position of the test receiver.

MW Local Oscillator Check

Connect the IC terminals directly to an oscilloscope and compare the waveforms with those shown in the diagrams.

(4) AGC Circuit (Automatic Gain Control)

The AGC circuit in this unit is divided into two stages, that is, a reverse AGC in IC4, and a shunt AGC for Q2. The AGC circuit can be checked by measuring the voltage at terminals 5 and 6 of IC4, and terminal 1 of IC5.

The voltage of terminal 5 of IC4 starts to give negative values when the tuning meter reads about 2. A reading of 8 indicates a voltage of about -0.2 V. The voltage at terminal 6 will range from 1.2 V to 1.4 V (tuning meter reading from about 8 and above) for inputs of 74 dB/m and above for MW, and 44 dB and above for SW. Voltages below this range are 0 V shown. The voltages at terminal 1 of IC5 are about half the value of those produced at terminal 6 of IC4 above.

(5) Power Amplifier

This small sized power amplifier produces a large output due to its BTL circuit (Balanced Transformerless). The BTL circuit consists of two SEPP (Single Ended Push-Pull) amplifiers combined together as shown in Fig. 1-4. Out-of-phase signals are applied to the inputs, while a load (speaker) is connected across the outputs. By employing a speaker of equal impedance and the equal B+ voltage, the output obtained by the BTL is about 4 times as great as obtained by an SEPP circuit. An OCL circuit (Output Capacitorless) can also be formed with a single power supply.

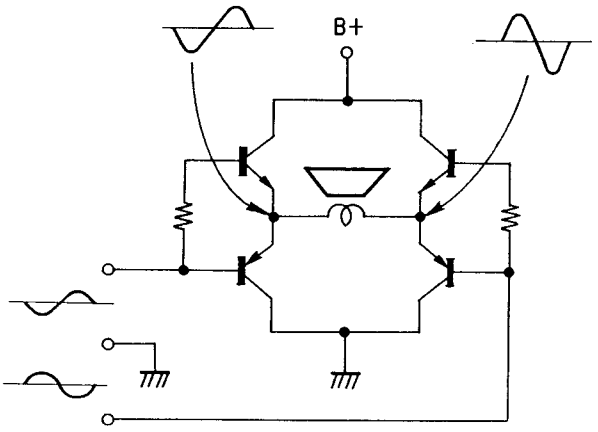
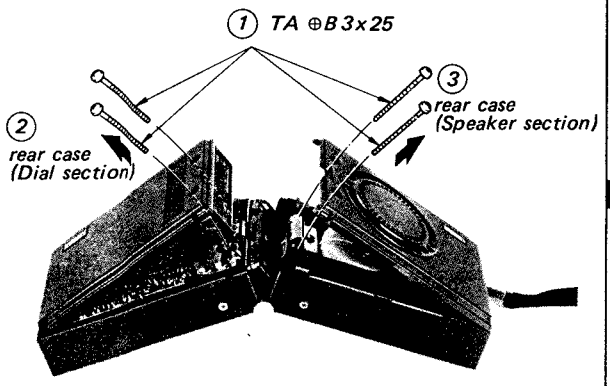


Fig. 1-4

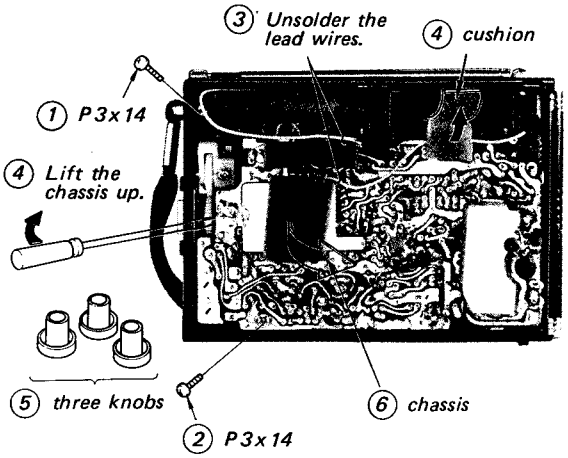
SECTION 2
DISASSEMBLY

2-1. REMOVAL AND REPLACEMENT

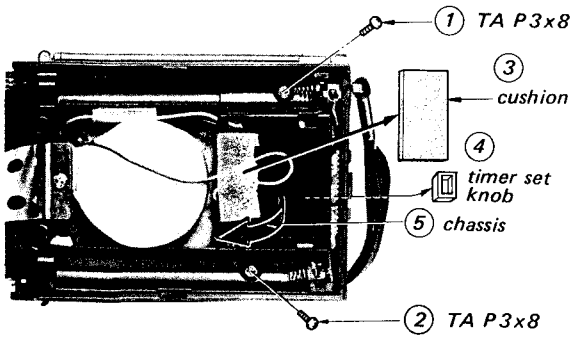
Rear Case (Speaker and Dial sections) Removal



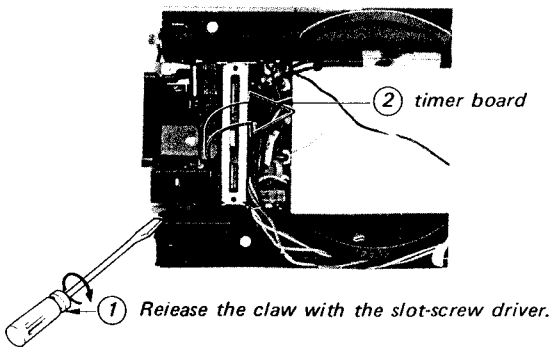
Chassis (Dial section) Removal



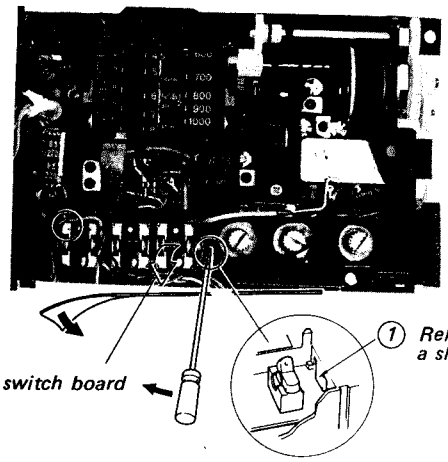
Chassis (Speaker section) Removal



Timer Board Removal



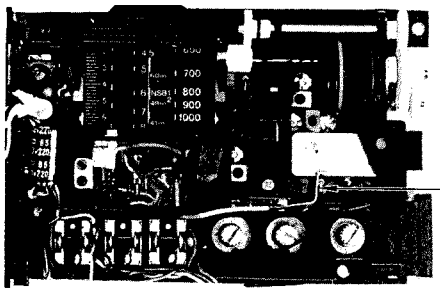
Switch Board Removal



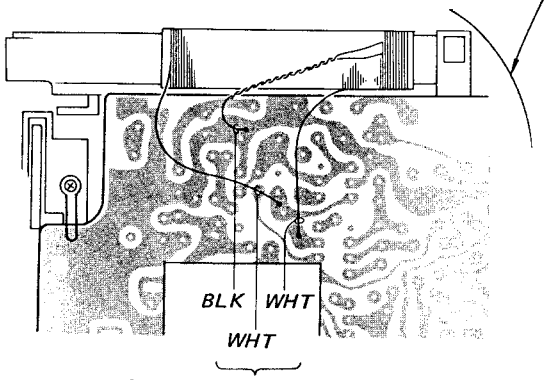
① Release the claw with a slot-screwdriver.

② switch board

Main Board Removal

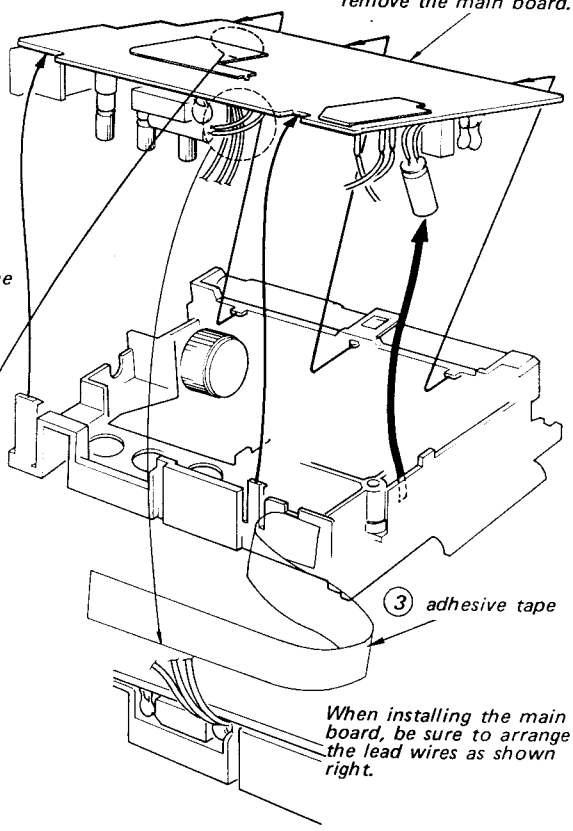


① Unsolder the lead wires.



② Unsolder the lead wires.

④ Release the claws and remove the main board.

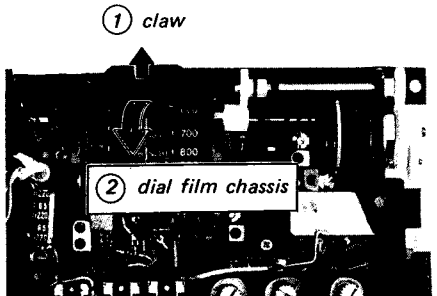


③ adhesive tape

When installing the main board, be sure to arrange the lead wires as shown right.

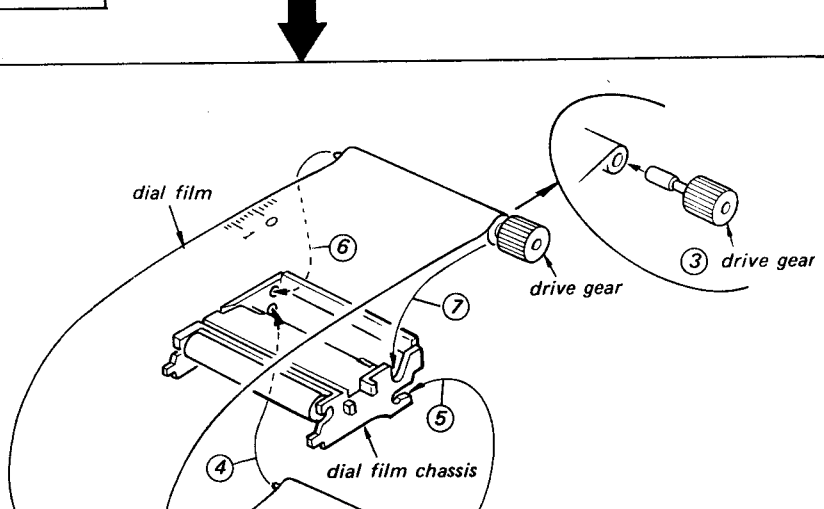
Note: *After replacing the main board, dial film calibration should be performed.* *(on page 9)*

Dial Film Chassis Removal

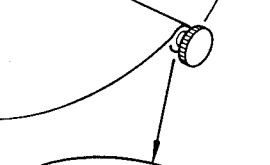


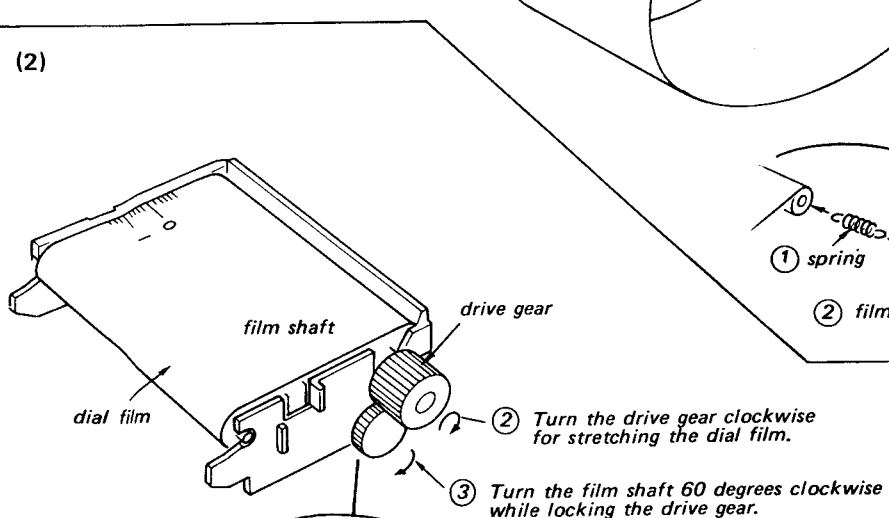
Dial Film Replacement

(1)

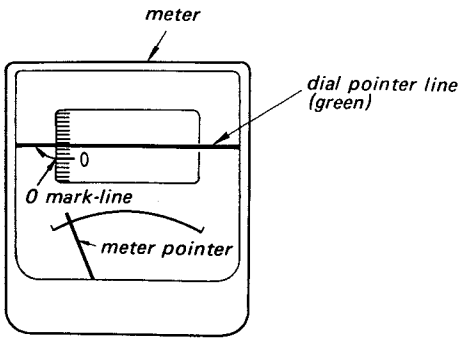


(2)

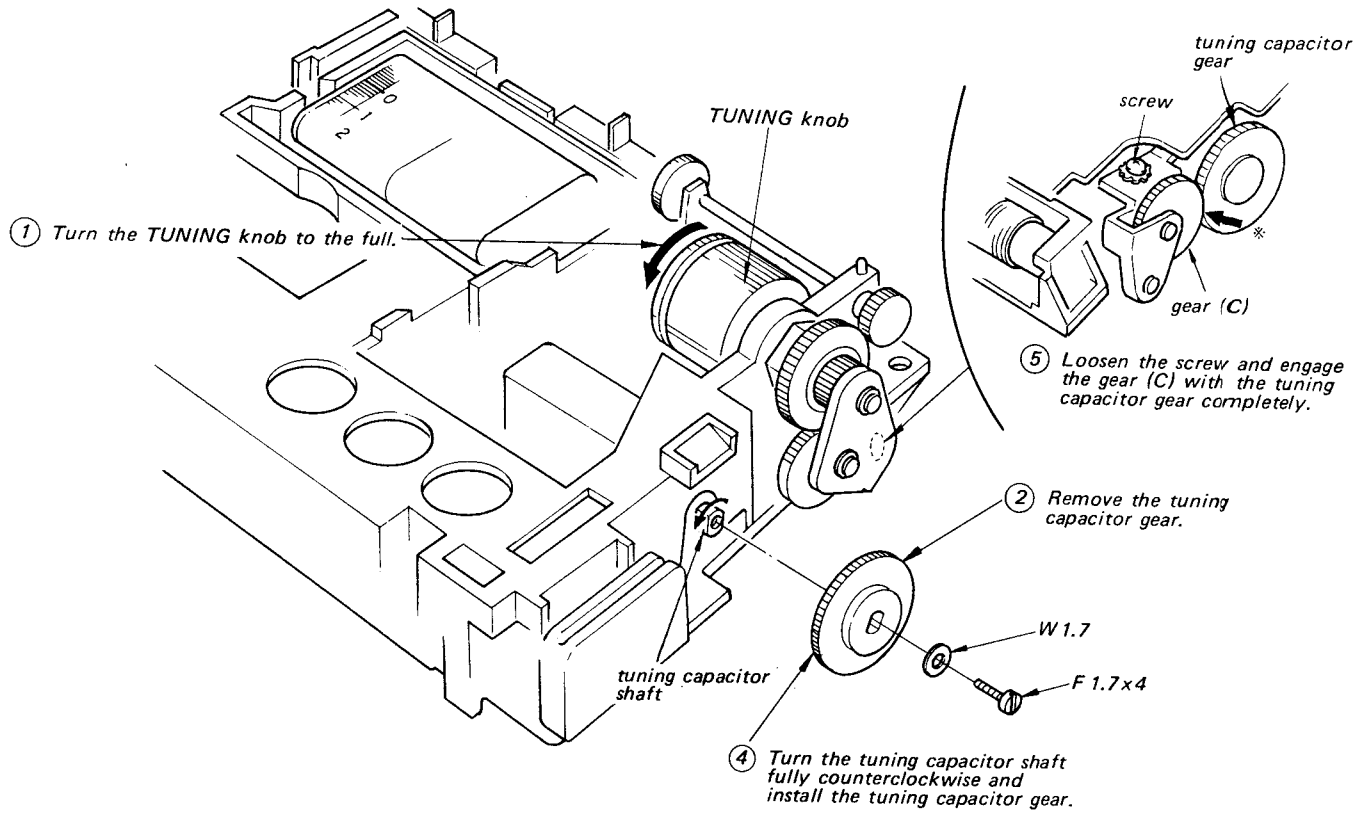



film shaft
drive gear
dial film
② Turn the drive gear clockwise for stretching the dial film.
③ Turn the film shaft 60 degrees clockwise while locking the drive gear.
① Pull and disengage the drive gear from the film shaft.
drive gear
④ Push the drive gear in.
film shaft

2-2. DIAL FILM CALIBRATION

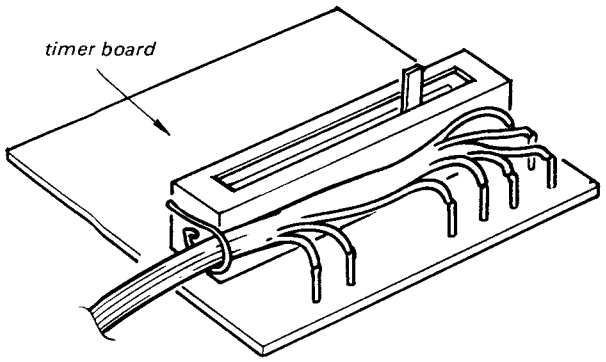


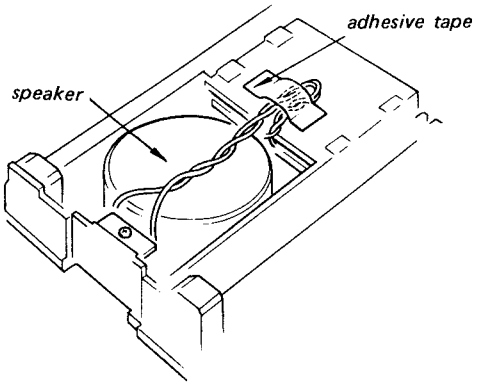
③ Install the meter and turn the TUNING knob so that the 0 mark-line on the dial film coincide with the dial pointer line on the meter.

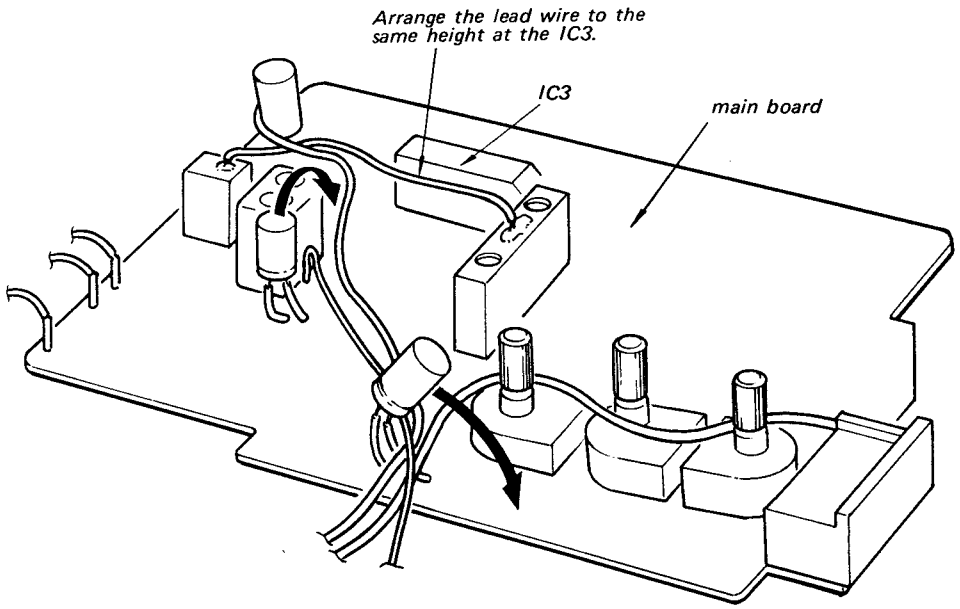

TUNING knob
① Turn the TUNING knob to the full.
tuning capacitor gear
screw
gear (C)
⑤ Loosen the screw and engage the gear (C) with the tuning capacitor gear completely.
② Remove the tuning capacitor gear.
W1.7
F1.7x4
tuning capacitor shaft
④ Turn the tuning capacitor shaft fully counterclockwise and install the tuning capacitor gear.

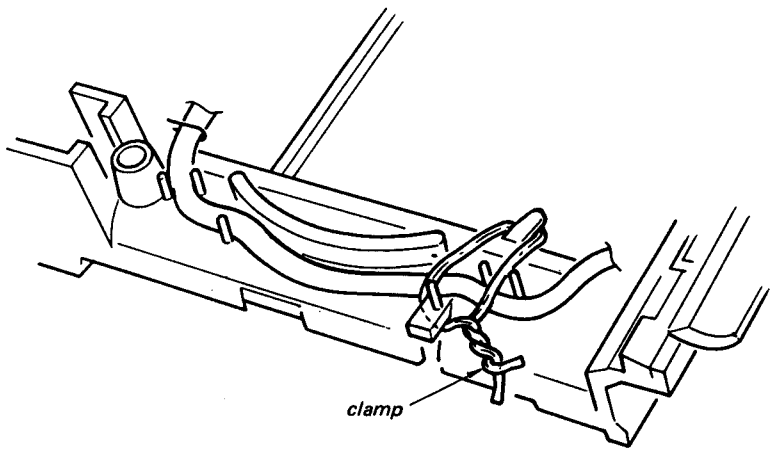
2-3. LEAD WIRE ARRANGEMENT

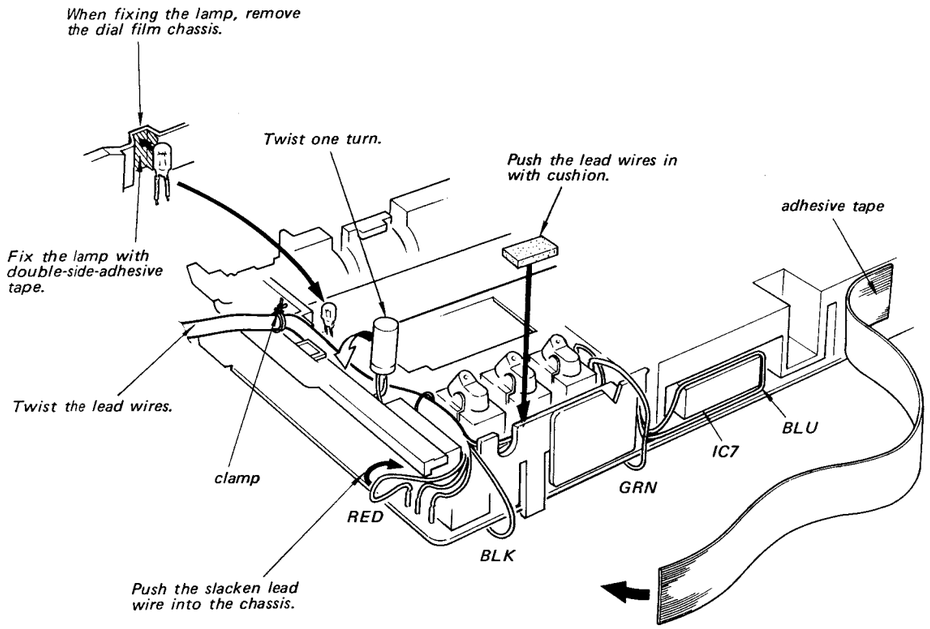
Arrange the lead wires as shown below.





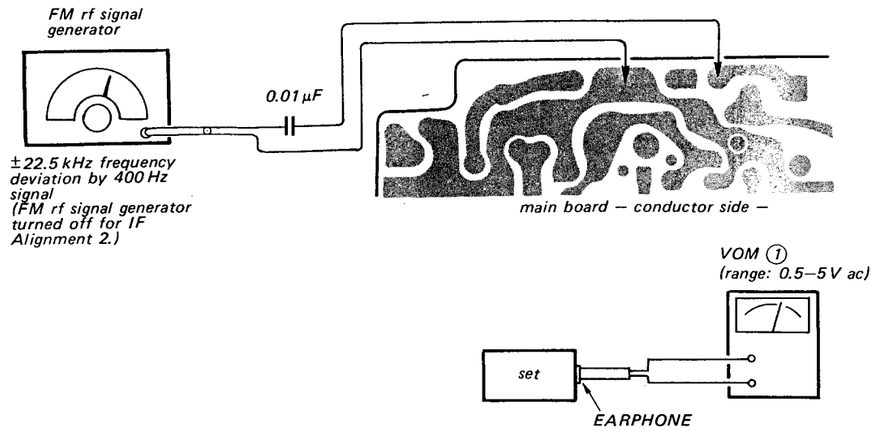




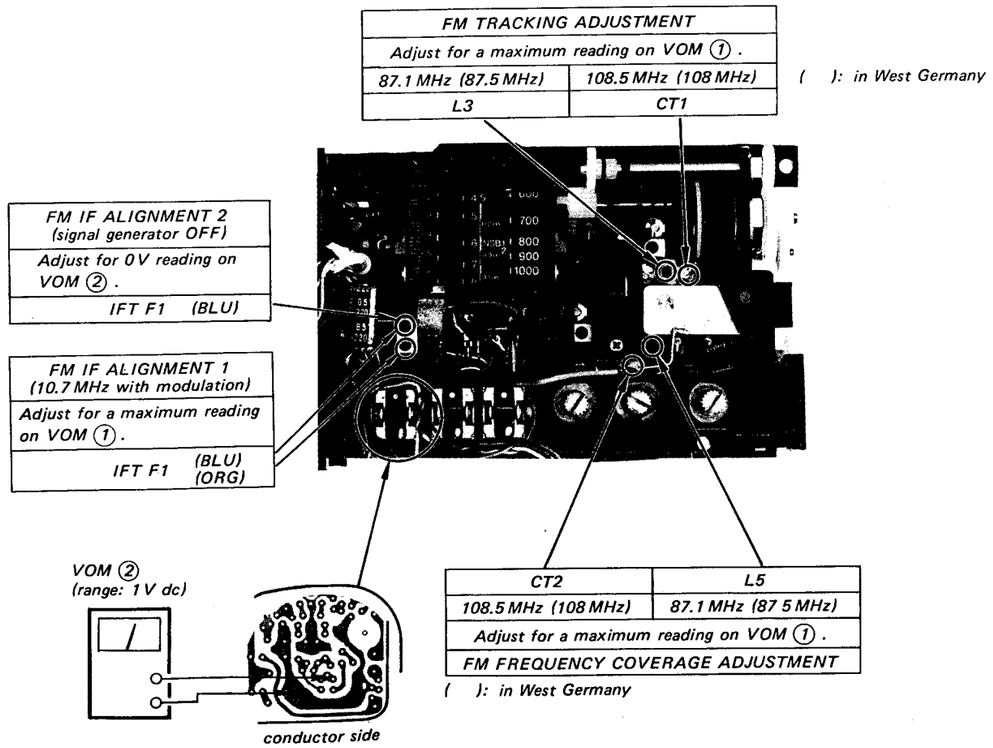


SECTION 3
ADJUSTMENTS

3-1. FM SECTION

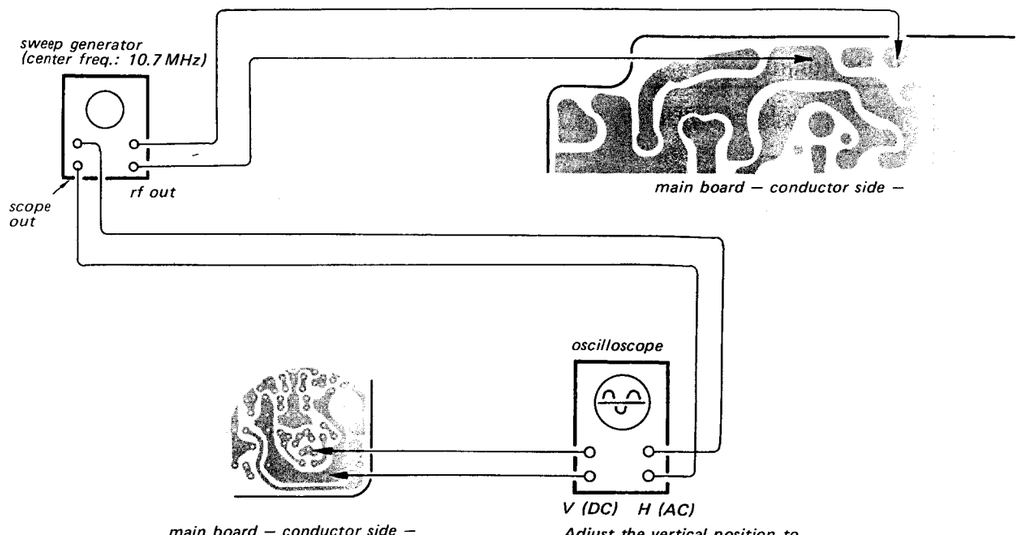

FM rf signal generator
0.01 μF
±22.5 kHz frequency deviation by 400 Hz signal
(FM rf signal generator turned off for IF Alignment 2.)
main board — conductor side —
VOM ①
(range: 0.5—5 V ac)
set
EARPHONE

Note: Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.


FM TRACKING ADJUSTMENT
Adjust for a maximum reading on VOM ① .
87.1 MHz (87.5 MHz)
108.5 MHz (108 MHz)
L3
CT1
( ): in West Germany
FM IF ALIGNMENT 2 (signal generator OFF)
Adjust for 0 V reading on VOM ② .
IFT F1 (BLU)
FM IF ALIGNMENT 1 (10.7 MHz with modulation)
Adjust for a maximum reading on VOM ① .
IFT F1 (BLU) (ORG)
VOM ②
(range: 1 V dc)
conductor side
CT2
L5
108.5 MHz (108 MHz)
87.1 MHz (87.5 MHz)
Adjust for a maximum reading on VOM ① .
FM FREQUENCY COVERAGE ADJUSTMENT
( ): in West Germany

FM IF ALIGNMENT (with 10.7 MHz Sweep Generator)

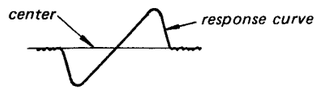
Setting:


sweep generator
(center freq.: 10.7 MHz)
rf out
scope out
main board – conductor side –
oscilloscope
V (DC) H (AC)
Adjust the vertical position to center the sweep base-line.
main board – conductor side –

Procedure:

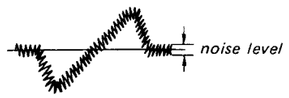
1. Adjust the sweep range of the generator so that the full width of the response curve appears on the oscilloscope.

2. Turn the primary core (BLU) of IFT F1 to position the response curve in center as shown below.

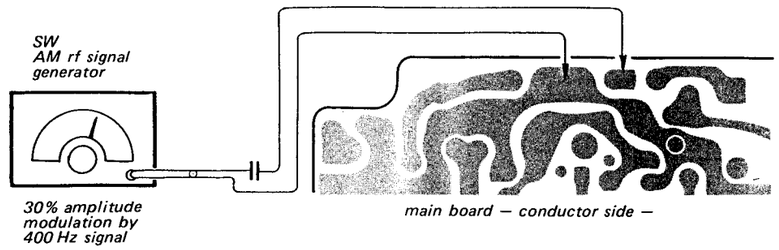


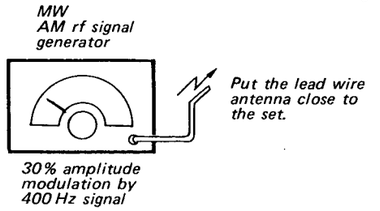
Note: The responce curve is changed up and down only.

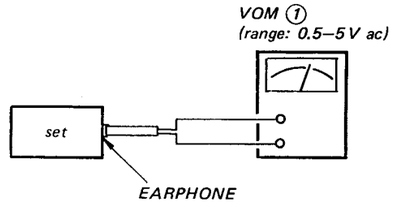
3. Turn the secondary core (ORG) of IFT F1 to obtain the maximum noise level as shown below.



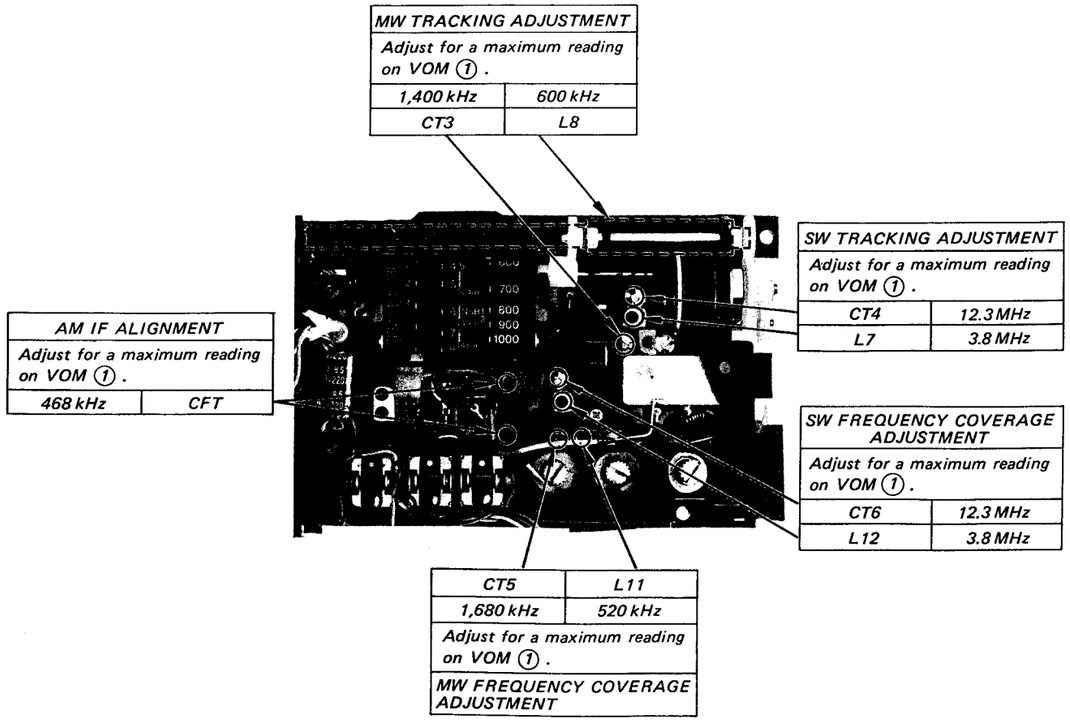
3-2. AM SECTION



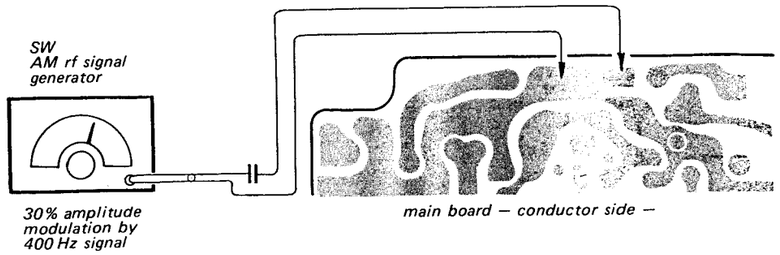


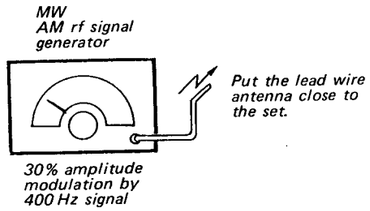


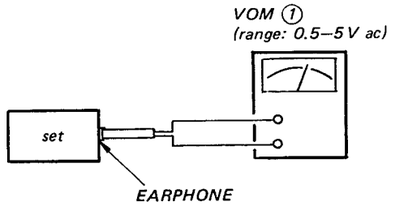
Note:
- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- After adjusting the SW frequency coverage and tracking adjustments perform the MW adjustments.



3-2. AM SECTION







Note:
- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- After adjusting the SW frequency coverage and tracking adjustments perform the MW adjustments.

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
1,400 kHz	600 kHz
CT3	L8

SW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
CT4	12.3 MHz
L7	3.8 MHz

AM IF ALIGNMENT	
Adjust for a maximum reading on VOM ①.	
468 kHz	CFT

SW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
CT6	12.3 MHz
L12	3.8 MHz

CT5	L11
1,680 kHz	520 kHz
Adjust for a maximum reading on VOM ①.	
MW FREQUENCY COVERAGE ADJUSTMENT	

3-3. TIMER ADJUSTMENT

Setting:

POWER switch: ON
Timer set control: minimum

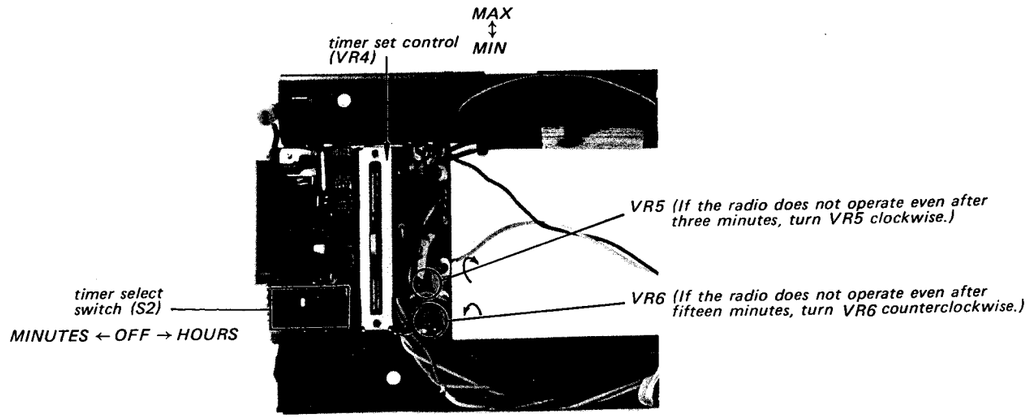
Procedure:

1. Turn the timer select switch from OFF to MINUTES and make sure that the radio operates after three minutes.

   Note: If necessary, adjust VR5 and repeat step 1.

2. Turn the timer select switch to HOURS and make sure that the radio operates after fifteen minutes.

   Note: If necessary, adjust VR6 and repeat step 2.


MAX
MIN
timer set control (VR4)
VR5 (If the radio does not operate even after three minutes, turn VR5 clockwise.)
VR6 (If the radio does not operate even after fifteen minutes, turn VR6 counterclockwise.)
timer select switch (S2)
MINUTES ← OFF → HOURS

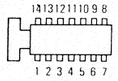
SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM

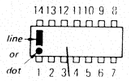
— Conductor Side —

IC1: CX160
IC2, 3: CX161
IC7: CX164

IC4: CX162
IC6: CX165

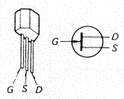


IC5: CX163

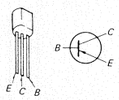


IC8: CX077

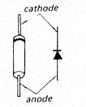
Q1, 2: 2SK42



Q3, 4: 2SA772
(2SA772A)

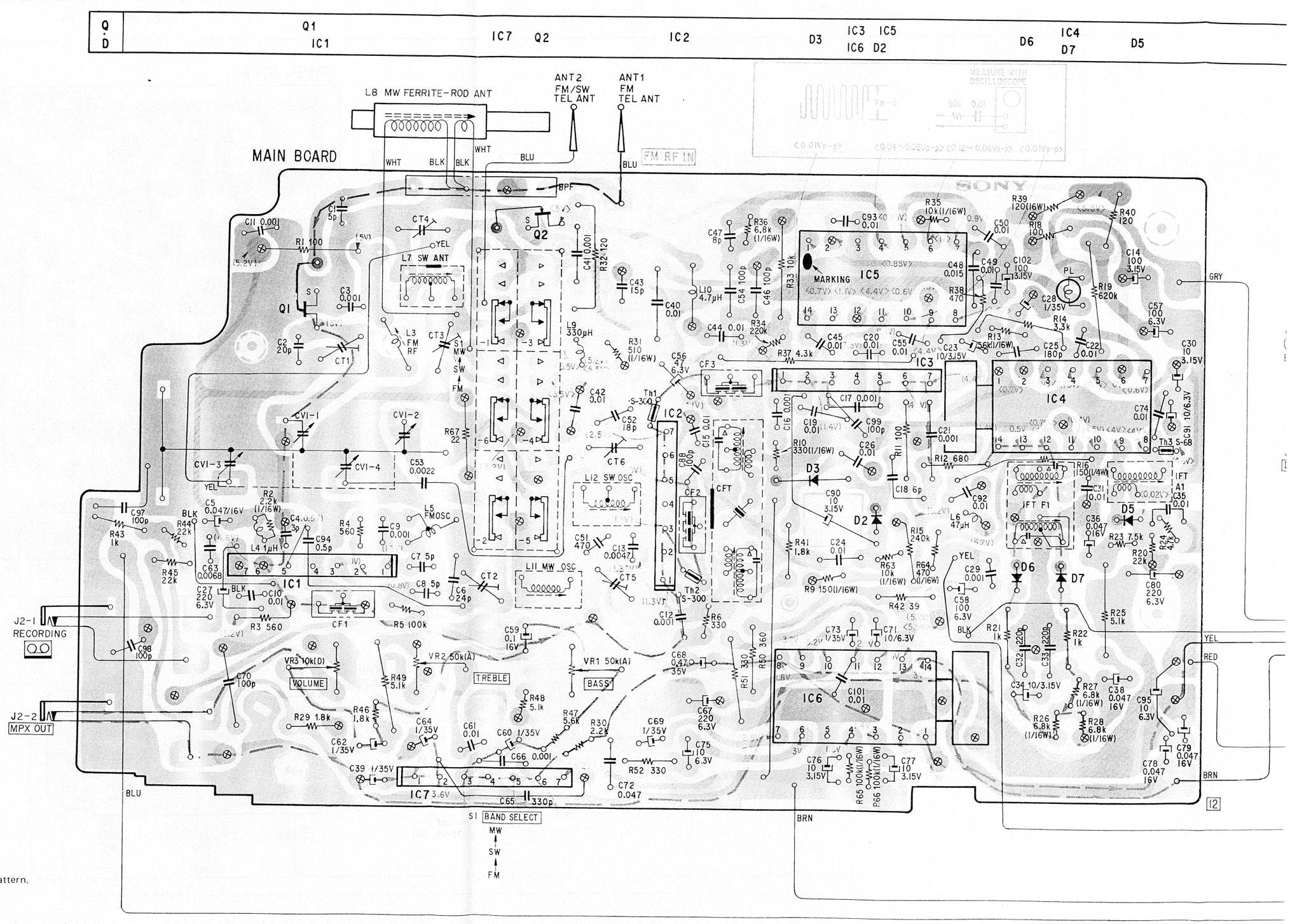


D2, 3: 1S2076
(1S2076A)
D4–7: 1T26
(1T261)

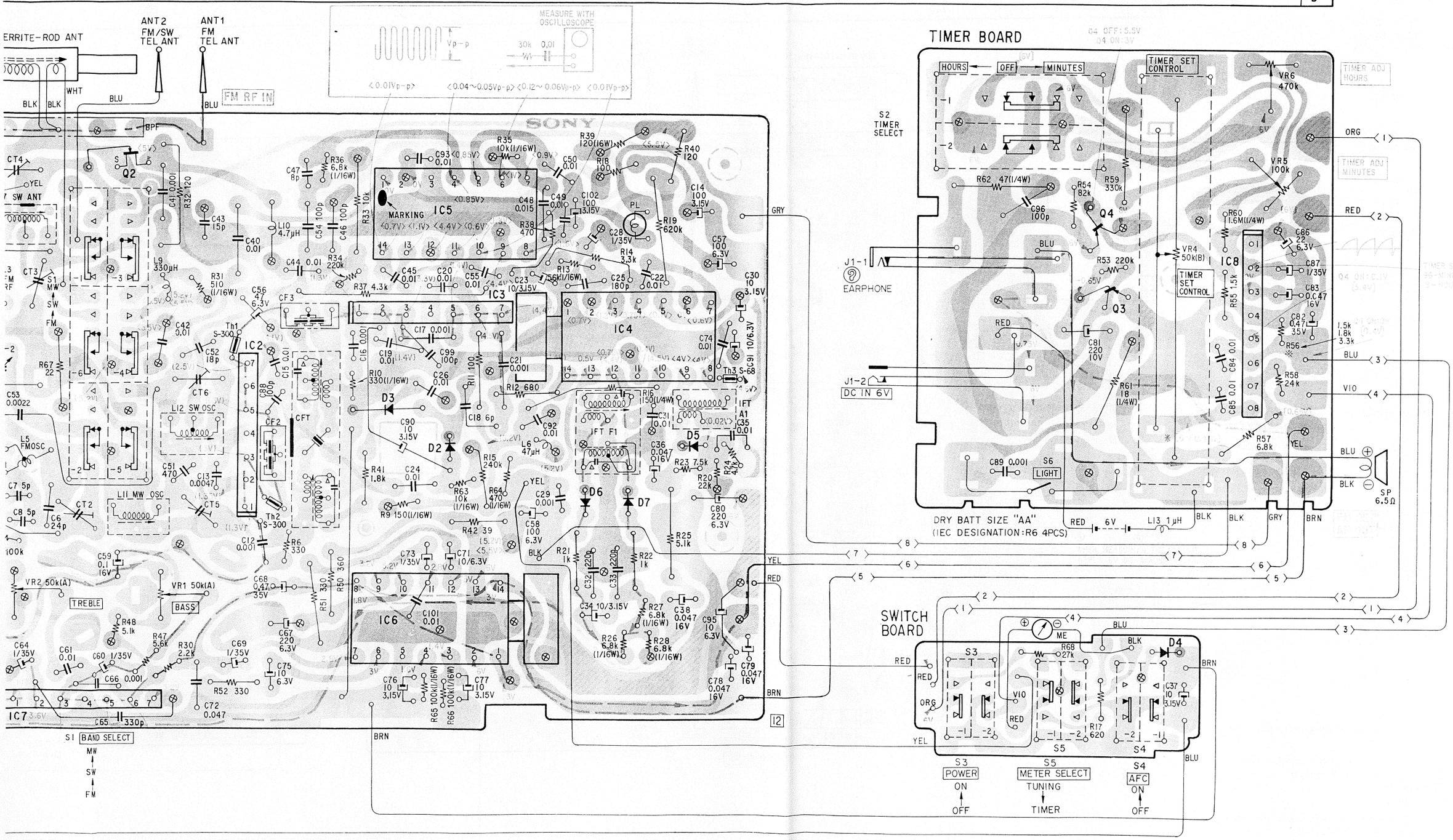


( ) : Replacement Semiconductors

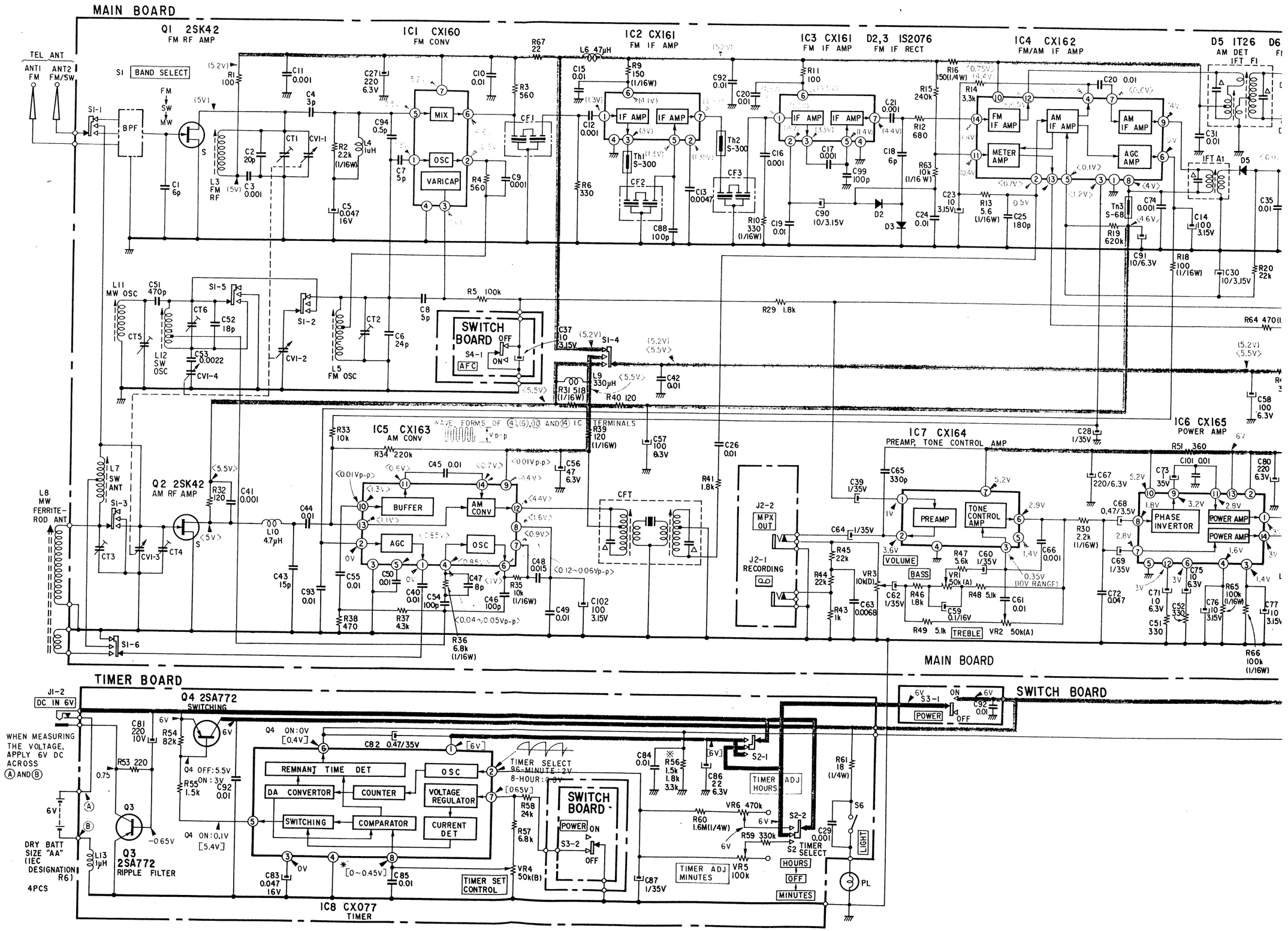
Note:
- ⊣ : indicates side identified with part number or with marking.
- ⊗ : Through hole.
- : signal path.
- : component side pattern except B+ pattern.
- : component side B+ pattern.

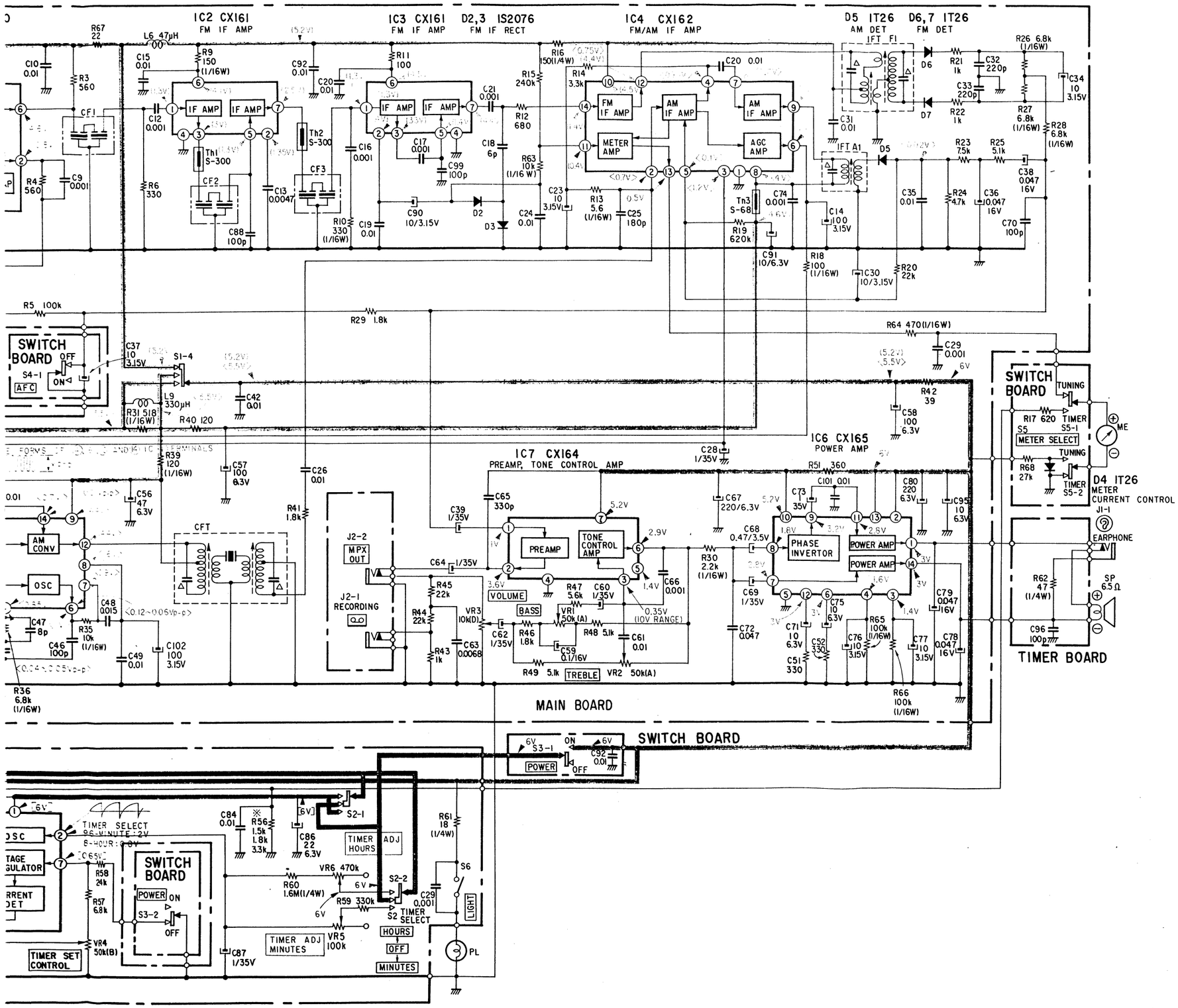


IC7 Q2 IC2 D3 IC3 IC5 IC6 D2 D6 IC4 D7 D5 Q4 Q3 D4 IC8 Q D



4-2. SCHEMATIC DIAGRAM





Note:

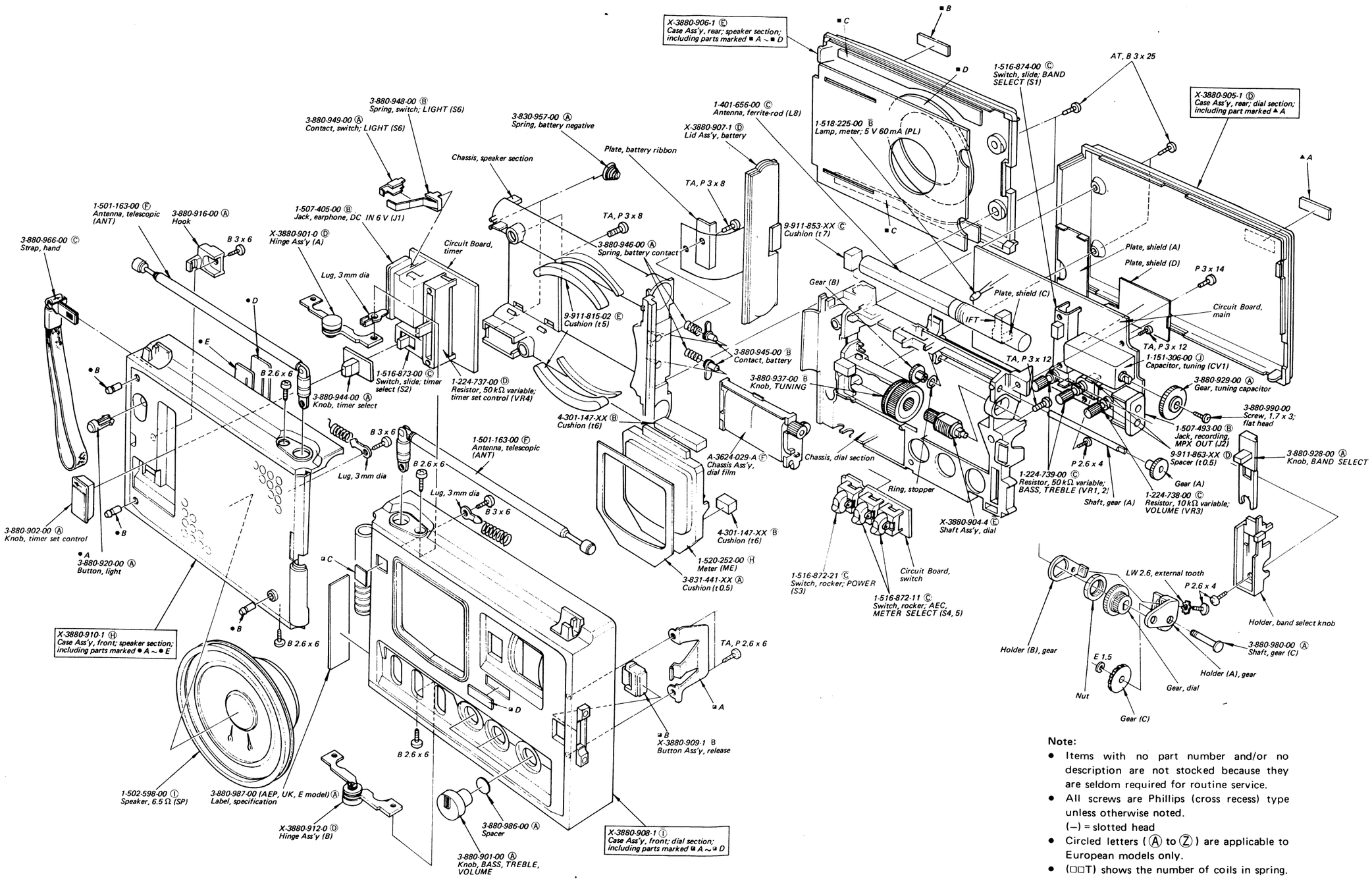
- All capacitors are in μF unless otherwise noted. pF = μμF 50V or less does not indicated except for electrolytics.
- All resistors are in ohms, 1/8W unless otherwise noted. kΩ = 1000Ω; MΩ = 1000 kΩ
- All adjustable resistors have characteristic curve B.
- R56 MARKED x varies according to the IC8.
  IC8 CX077-□□

-□□	R56 (Ω, 1/8W)
-10	1.5 k
-20	1.8 k
-30	3.3 k

- △: internal component.
- ▬: B+ bus.
- ▭: panel designation.
- ▭: adjustment for repair.
- ⏚: chassis ground.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) condition with a VOM (20 kΩ/V).
  [ ]: TIMER SELECT HOURS OR MINUTES
  〈 〉: AM
  ( ): FM
  ＊[ ]: VARIEGATED WITH TIMER SET CONTROL (VR4).
  no mark: COMMON
- Voltage variations may be noted due to normal production tolerances.
- Switch:

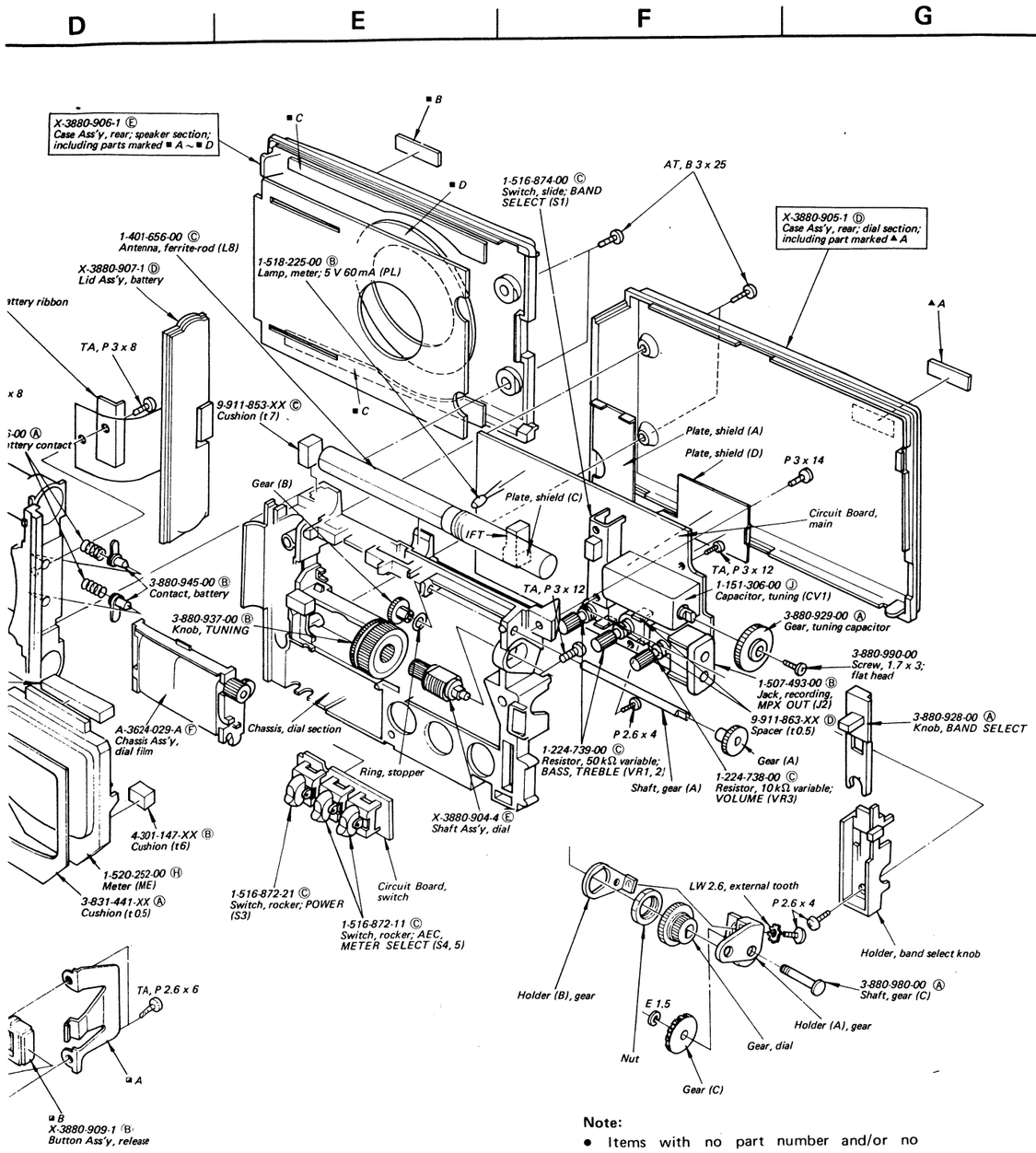
Ref. No.	Switch	Position
S1-1–1-6	BAND SELECT	FM
S2-1, 2-2	TIMER SELECT	OFF
S3-1, 3-2	POWER	OFF
S4	SQL/AFC	OFF
S5	METER SELECT	TUNING
S6	LIGHT	OFF

SECTION 5
EXPLODED VIEW



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.
- (□□T) shows the number of coils in spring.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.
- (□□T) shows the number of coils in spring.

SECTION 6
ELECTRICAL PARTS LIST

- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description
		SEMICONDUCTORS
		Transistors
Q1,2		Ⓒ 2SK42
⇒ Q3,4		Ⓒ 2SA772-23
		ICs
IC1		Ⓕ CX160
IC2,3		Ⓕ CX161
IC4		Ⓗ CX162
IC5		Ⓗ CX163
IC6		Ⓛ CX165
IC7		Ⓕ CX164
IC8		Ⓚ CX077
		Diodes
⇒ D2,3		Ⓑ 1S2076A
⇒ D4~7		Ⓑ 1T261
		Thermistors
Th1,2	1-800-071-XX	Ⓐ S-300
Th3	1-800-193-00	Ⓐ S-68
		TRANSFORMERS
IFTA1	1-404-022-00	Ⓑ AM IFT
IFTF1	1-404-032-00	Ⓒ FM IFT
		FILTERS
BPF	1-231-315-00	Ⓑ BPF, FM
CF1~3	1-527-184-XX	Ⓑ Ceramic, 10.7 MHz
CFT	1-404-070-00	Ⓔ Ceramic, SW, MW
		COILS
L3	1-459-183-00	Ⓑ FM RF
L4	1-407-882-00	Ⓑ 1μH
L5	1-459-187-00	Ⓑ FM OSC
L6	1-407-471-00	Ⓑ Microinductor, 47μH
L7	1-401-647-00	Ⓑ SW ANT
L8	1-401-656-00	Ⓒ Antenna, ferrite-rod
L9	1-407-481-00	Ⓑ Microinductor, 330μH
L10	1-407-186-XX	Ⓐ Microinductor, 4.7μH
L11	1-405-709-00	Ⓑ MW OSC
L12	1-405-708-00	Ⓑ SW OSC
L13	1-407-178-XX	Ⓑ Microinductor, 1μH

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

CAPACITORS

All capacitors are in μF and of ceramic unless otherwise noted. (p = μμF, elect = electrolytic) 50 or less working voltages are omitted except for electrolytic type.

Ref. No.	Part No.			
C1	1-102-943-11	Ⓐ 6p		
C2	1-102-958-11	Ⓐ 20p		
C3	1-161-026-11	Ⓐ 0.001		(boundary layer)
C4	1-102-936-11	Ⓐ 3p		
C5	1-127-018-11	Ⓑ 0.047	16 V	solid aluminum
C6	1-102-960-11	Ⓐ 24p		
C7,8	1-102-942-11	Ⓐ 5p		
C9	1-102-268-11	Ⓐ 0.001		
C10	1-161-032-11	Ⓐ 0.01		(boundary layer)
C11	1-161-026-11	Ⓐ 0.001		(boundary layer)
C12	1-102-268-11	Ⓐ 0.001		
C13	1-161-030-11	Ⓐ 0.0047		(boundary layer)
C14	1-131-187-11	Ⓑ 100	3.15 V	tantalum
C15	1-161-032-11	Ⓐ 0.01		(boundary layer)
C16	1-161-026-11	Ⓐ 0.001		(boundary layer)
C17	1-102-268-11	Ⓐ 0.001		
C18	1-102-943-11	Ⓐ 6p		
C19,20	1-161-032-11	Ⓐ 0.01		(boundary layer)
C21	1-102-268-11	Ⓐ 0.001		
C22	1-161-032-11	Ⓐ 0.01		(boundary layer)
C23	1-131-182-11	Ⓑ 10	3.15 V	tantalum
C24	1-161-032-11	Ⓐ 0.01		(boundary layer)
C25	1-102-109-11	Ⓐ 180p		
C26	1-161-032-11	Ⓐ 0.01		(boundary layer)
C27	1-121-931-11	Ⓑ 220	6.3 V	elect

• Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.		Description	
C28	1-131-215-11	Ⓑ 1	35 V	tantalum
C29	1-161-026-11	Ⓐ 0.001		(boundary layer)
C30	1-131-182-11	Ⓑ 10	3.15 V	tantalum
C31	1-161-032-11	Ⓐ 0.01		(boundary layer)
C32,33	1-102-110-11	Ⓐ 220 p		
C34	1-131-182-11	Ⓑ 10	3.15 V	tantalum
C35	1-161-032-11	Ⓐ 0.01		(boundary layer)
C36	1-127-018-11	Ⓑ 0.047	16 V	solid aluminum
C37	1-131-182-11	Ⓑ 10	3.15 V	tantalum
C38	1-127-018-11	Ⓑ 0.047	16 V	solid aluminum
C39	1-131-215-11	Ⓑ 1	35 V	tantalum
C40	1-161-032-11	Ⓐ 0.01		(boundary layer)
C41	1-161-026-11	Ⓐ 0.001		(boundary layer)
C42	1-101-923-11	Ⓐ 0.01		
C43	1-102-951-11	Ⓐ 15 p		
C44,45	1-161-032-11	Ⓐ 0.01		(boundary layer)
C46	1-102-973-11	Ⓐ 100 p		
C47	1-102-945-11	Ⓐ 8 p		
C48	1-161-033-11	Ⓐ 0.015		(boundary layer)
C49,50	1-161-032-11	Ⓐ 0.01		(boundary layer)
C51	1-102-426-11	Ⓐ 470 p		
C52	1-102-893-11	Ⓐ 18 p		
C53	1-102-121-11	Ⓐ 0.0022		
C54	1-102-973-11	Ⓐ 100 p		
C55	1-161-032-11	Ⓐ 0.01		(boundary layer)
C56	1-131-191-11	Ⓒ 47	6.3 V	tantalum
C57,58	1-123-201-11	Ⓑ 100	6.3 V	elect
C59	1-127-019-11	Ⓑ 0.1	16 V	solid aluminum
C60	1-131-215-11	Ⓑ 1	35 V	tantalum
C61	1-161-032-11	Ⓐ 0.01		(boundary layer)
C62	1-131-215-11	Ⓑ 1	35 V	tantalum
C63	1-161-031-11	Ⓑ 0.0068		(boundary layer)
C64	1-131-215-11	Ⓑ 1	35 V	tantalum
C65	1-102-112-11	Ⓐ 330 p		
C66	1-161-026-11	Ⓐ 0.001		(boundary layer)
C67	1-121-931-11	Ⓑ 220	6.3 V	elect
C68	1-131-213-11	Ⓑ 0.47	35 V	tantalum
C69	1-131-215-11	Ⓑ 1	35 V	tantalum
C70	1-102-106-11	Ⓐ 100 p		
C71	1-131-228-11	Ⓑ 10	6.3 V	tantalum
C72	1-127-018-11	Ⓑ 0.047	16 V	solid aluminum
C73	1-131-215-11	Ⓑ 1	35 V	tantalum
C74	1-161-026-11	Ⓐ 0.001		(boundary layer)
C75	1-131-228-11	Ⓑ 10	6.3 V	tantalum
C76,77	1-131-182-11	Ⓐ 10	3.15 V	tantalum
C78,79	1-127-018-11	Ⓑ 0.047	16 V	solid aluminum
C80	1-121-931-11	Ⓑ 220	6.3 V	elect
C81	1-121-977-11	Ⓑ 220	10 V	elect
C82	1-131-213-11	Ⓑ 0.47	35 V	tantalum
C83	1-127-018-11	Ⓑ 0.047	16 V	solid aluminum
C84,85	1-161-032-11	Ⓐ 0.01		(boundary layer)
C86	1-131-201-11	Ⓒ 22	6.3 V	tantalum
C87	1-131-215-11	Ⓑ 1	35 V	tantalum
C88	1-102-106-11	Ⓐ 100 p		
C89	1-161-026-11	Ⓐ 0.001		(boundary layer)
C90	1-131-182-11	Ⓑ 10	3.15 V	tantalum
C91	1-131-228-11	Ⓑ 10	6.3 V	tantalum
C92,93	1-161-032-11	Ⓐ 0.01		(boundary layer)
C94	1-101-837-11	Ⓐ 0.5 p		
C95	1-131-228-11	Ⓑ 10	6.3 V	tantalum
C96,98,99	1-102-973-11	Ⓐ 100 p		
C101	1-161-032-11	Ⓐ 0.01		(boundary layer)
C102	1-131-187-11	Ⓑ 100	3.15 V	tantalum
CT1~6	1-141-174-00	Ⓑ Trimmer		
CV1	1-151-306-00	Ⓙ Tuning		

RESISTORS

All resistors are in Ω, 1/8 W and composition type unless otherwise noted. k = 1,000, M = 1,000 k

Ref. No.	Part No.			
R1	1-201-679-11	Ⓐ 100		
R2	1-209-768-11	Ⓐ 2.2 k	1/16 W	carbon
R3,4	1-201-872-11	Ⓐ 560		
R5	1-202-101-11	Ⓐ 100 k		
R6	1-201-870-11	Ⓐ 330		
R9	1-210-102-11	Ⓐ 150	1/16 W	carbon
R10	1-209-763-11	Ⓐ 330	1/16 W	carbon
R11	1-201-679-11	Ⓐ 100		
R12	1-201-275-11	Ⓐ 680		
R13	1-209-775-11	Ⓐ 5.6 k	1/16 W	carbon
R14	1-202-013-11	Ⓐ 3.3 k		
R15	1-202-125-11	Ⓐ 240 k		
R16	1-202-363-11	Ⓐ 150	1/4 W	
R17	1-201-624-11	Ⓐ 620		
R18	1-210-355-11	Ⓐ 2.2 k	1/16 W	carbon
R19	1-202-153-11	Ⓐ 620 k		
R20	1-201-867-11	Ⓐ 22 k		
R21,22	1-201-634-11	Ⓐ 1 k		
R23	1-202-034-11	Ⓐ 7.5 k		
R24	1-202-023-11	Ⓐ 4.7 k		
R25	1-202-024-11	Ⓐ 5.1 k		
R26~28	1-209-777-11	Ⓐ 6.8 k	1/16 W	carbon
R29	1-201-650-11	Ⓐ 1.8 k		
R30	1-209-768-11	Ⓐ 2.2 k	1/16 W	carbon
R31	1-210-104-11	Ⓐ 510	1/16 W	carbon
R32	1-201-391-11	Ⓐ 120		
R33	1-202-043-11	Ⓐ 10 k		
R34	1-202-123-11	Ⓐ 220 k		
R35	1-209-781-11	Ⓐ 10 k	1/16 W	carbon
R36	1-209-777-11	Ⓐ 6.8 k	1/16 W	carbon
R37	1-202-020-11	Ⓐ 4.3 k		
R38	1-201-453-11	Ⓐ 470		
R39	1-210-357-11	Ⓐ 120	1/16 W	carbon
R40	1-201-982-11	Ⓐ 120		
R41	1-201-650-11	Ⓐ 1.8 k		
R42	1-201-839-11	Ⓐ 39		
R43	1-201-634-11	Ⓐ 1 k		
R44,45	1-201-867-11	Ⓐ 22 k		
R46	1-201-650-11	Ⓐ 1.8 k		
R47	1-202-027-11	Ⓐ 5.6 k		
R48,49	1-202-024-11	Ⓐ 5.1 k		
R50	1-201-859-11	Ⓐ 360		
R51,52	1-201-870-11	Ⓐ 330		
R53	1-201-992-11	Ⓐ 220		
R54	1-202-095-11	Ⓐ 82 k		
R55	1-203-847-11	Ⓐ 1.5 k		
R56	1-201-644-11	Ⓐ 1.5 k		
R56	1-201-650-11	Ⓐ 1.8 k		
R56	1-201-860-11	Ⓐ 3.3 k		
R57	1-202-031-11	Ⓐ 6.8 k		
R58	1-202-248-11	Ⓐ 24 k		
R59	1-202-133-11	Ⓐ 330 k		
R60	1-202-460-11	Ⓐ 1.6 M	1/4 W	
R61	1-202-331-11	Ⓐ 18	1/4 W	
R62	1-202-341-11	Ⓐ 47	1/4 W	
R63	1-209-781-11	Ⓐ 10 k	1/16 W	carbon
R64	1-209-764-11	Ⓐ 470	1/16 W	carbon
R65,66	1-210-115-11	Ⓐ 100 k	1/16 W	carbon
R67	1-201-953-11	Ⓐ 22		
R68	1-201-861-11	Ⓐ 27 k		
VR1,2	1-224-739-00	Ⓒ 50 k, variable; BASS TREBLE		
VR3	1-224-738-00	Ⓒ 10 k, variable; VOLUME		
VR4	1-224-737-00	Ⓓ 50 k, variable; timer set control		
VR5	1-224-225-XX	Ⓑ 100 k, adjustable		
VR6	1-224-740-00	Ⓑ 470 k, adjustable		

SWITCHES

S1	1-516-874-00	Ⓒ Slide, BAND SELECT
S2	1-516-873-00	Ⓒ Slide, timer select
S3	1-516-872-21	Ⓒ Rocker, POWER
S4,5	1-516-872-11	Ⓒ Rocker, AFC, METER SELECT
S6	3-880-948-00	Ⓑ Spring, switch; LIGHT
	3-880-949-00	Ⓐ Contact, switch; LIGHT

JACKS

J1	1-507-405-00	Ⓑ Earphone, DC IN 6 V
J2	1-507-493-00	Ⓑ Recording, MPX OUT

MISCELLANEOUS

ANT1,2	1-501-163-00	Ⓕ Antenna, telescopic
ME	1-520-252-00	Ⓗ Meter
PL	1-518-225-00	Ⓑ Lamp, meter; 5 V 60 mA
SP	1-502-598-00	Ⓘ Speaker, 6.5 Ω

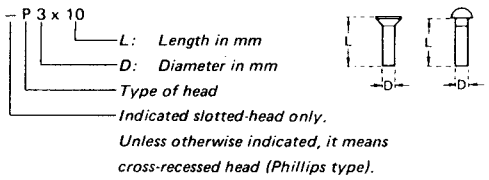
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

ACCESSORIES & PACKING MATERIALS

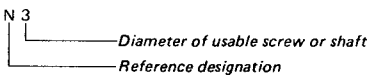
Part No.	*Description*
1-504-059-11	Ⓒ Earphone (ME-20H)
3-816-719-00	Ⓑ Case, earphone
3-880-962-00	Ⓑ Spacer
3-880-963-00	Ⓐ Bag
3-880-964-11	Ⓒ Carton
3-880-964-21	Ⓒ Carbon
3-880-965-00	Ⓑ Cushion
3-995-740-11	Ⓑ Manual, instruction

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
		SCREWS	
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
		SELF-TAPPING SCREWS	
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
		SET SCREWS	
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
		NUT	
N		nut	
		WASHERS	
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
		RETAINING RINGS	
E		retaining ring	
G		grip-type retaining ring	